FINAL REPORT
JULY 2007

REPORT NO. 06-04H

EVALUATION TRANSPORTABILITY TESTING OF THE JOINT MODULAR INTERMODAL PLATFORM (JMIP) UNIT #4 TP-94-01, "TRANSPORTABILITY TESTING PROCEDURES"

Prepared for:

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EVALUATION TRANSPORTABILITY TESTING OF THE JOINT MODULAR INTERMODAL PLATFORM (JMIP) UNIT #4 TP-94-01, REV. 2, JUNE 2004, "TRANSPORTABILITY TESTING PROCEDURES"

ABSTRACT

The U.S. Army Defense Ammunition Center (DAC), Validation Engineering Division (SJMAC-DEV), was tasked by the Logistics Research and Engineering Directorate (AMSRD-AAR-AIL-F), Picatinny Arsenal, NJ, to conduct evaluation transportability testing on the Joint Modular Intermodal Platform (JMIP) Unit #4 manufactured by SEA BOX, Inc, East Riverton, NJ. The testing was conducted in accordance with TP-94-01, Revision 2, June 2004 "Transportability Testing Procedures." The test payload consisted of pallets of 155MM Separate Loading Projectiles (SLPs) and Joint Modular Intermodal Containers (JMICs).

The objective of the testing was to identify the adequacy of the JMIP for demonstration use and not final approval when transportability tested in accordance with TP-94-01, Revision 2, June 2004.

The following observations resulted from the testing of JMIP Unit #4:

1. Prior to the start of testing the pins that hold the A-frame in the container transport position were replaced, the loose hex head rivets on the top of the deck were tightened, and the bolts holding the rear bumpers were tightened.
2. Forward and aft web restraints (crossing straps) were used at each end of the 155MM SLP payload. Traditionally, restraining straps across the end of the load are not used on 155MM SLP payloads. The restraint straps were added to reduce the stress imposed during testing on the intermediate gates.
3. The SEA BOX intermediate gates were used to restrain the payload.

4. The connection between the JMIC interface rings and the intermediate gates had enough tolerance to allow the gates and dunnage to go past vertical during testing.

5. The engage/disengage mechanism on the intermediate gate is only accessible from one side. Therefore, the gates have to be properly oriented or the mechanism may be blocked by the payload. The gate design should be uniform, with access to the mechanism on each side so that they do not have a front or back.

6. The operation of the engage/disengage mechanism was unsafe when installing/removing the intermediate gates due to problems with finger pinching.

7. The intermediate gates need a location where nails can be driven in and cinched to prevent movement of the dunnage between the gate and the payload.

8. The JMIP slid side-to-side throughout the STS testing. The movement of the adjustment bolt on the cams occurred during the testing. Future designs of the cam locking devices should prevent the bolts from moving in and out.

9. The main rails scuffed and dug into the container floor during the STS testing.

10. The bolts on the rear bumpers were loose at the end of the testing.

11. The lock rings on the roller shafts disengaged during testing and were found on the container floor.

12. The hex head rivets had loosened in several positions along the JMIP main rail.

13. The rail safety system pins that hold the main rails in position backed off during testing and had to be retightened.

The JMIP, as currently designed, is adequate to be used to transport the mixed load of 155MM SLPs and JMICs when using the intermediate gates and restraint straps on the end of the payload during the demonstrations.

The operational condition of the JMIP should be closely monitored during the demonstrations. Also, the Defense Ammunition Center, Transportation Engineering Division, shall be consulted for the ammunition loading and bracing instructions.

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REPORT NO. 06-04H

Evaluation Transportability Testing of the Joint Modular Intermodal Platform (JMIP) Unit #4 TP-94-01, Revision 2, June 2004 "Transportability Testing Procedures"

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PART 1 – INTRODUCTION

A. BACKGROUND. The U.S. Army Defense Ammunition Center (DAC), Validation Engineering Division (SJMAC-DEV), was tasked by the Logistics Research and Engineering Directorate (AMSRD-AAR-AIL-F), Picatinny Arsenal, NJ, to conduct evaluation transportability testing on the Joint Modular Intermodal Platform (JMIP) Unit #4 manufactured by SEA BOX, Inc, East Riverton, NJ. The testing was conducted in accordance with TP-94-01, Revision 2, June 2004 "Transportability Testing Procedures." The test payload consisted of pallets of 155 MM Separate Loading Projectiles (SLPs) and Joint Modular Intermodal Containers (JMICs).

B. AUTHORITY. This test was conducted IAW mission responsibilities delegated by the U.S. Army Joint Munitions Command (JMC), Rock Island, IL. Reference is made to the following:

1. AR 740-1, 15 June 2001, Storage and Supply Activity Operation.

2. OSC-R, 10-23, Mission and Major Functions of U.S. Army Defense Ammunition Center (DAC) 21 Nov 2000.

C. OBJECTIVE. The objective of the testing was to identify the adequacy of the JMIP for demonstration use and not final approval when transportability tested in accordance with TP-94-01, Revision 2, June 2004.

D. OBSERVATIONS.

1. Prior to the start of testing, the pins that hold the A-frame in the container transport were replaced, the loose hex head rivets on the top of the deck were tightened, and the bolts holding the rear bumpers were tightened.

2. Forward and aft restraint web straps were used at each end of the 155MM SLP payload to reduce the stress imposed during testing on the intermediate

gates. Traditionally, restraint straps across the end of the load are not used on 155MM SLP payloads.

3. The SEA BOX intermediate gates were used to restrain the payload.

4. The connection between the JMIC interface rings on and the intermediate gates had enough tolerance to allow the gates and dunnage to go past vertical during testing.

5. The engage/disengage mechanism on the intermediate gate is only accessible from one side. Therefore, the gates have to be properly oriented or the mechanism may be blocked by the payload. The gate design should be uniform, with access to the mechanism on each side so that they do not have a front or back.

6. The operation of the engage/disengage mechanism was unsafe when installing/removing the intermediate gates due to problems with finger pinching.

7. The intermediate gates need a location where nails can be driven in and cinched to prevent movement of the dunnage between the gate and the payload.

8. The JMIP slid side-to-side throughout the Shipboard Transportation Simulator (STS) testing. The movement of the adjustment bolt on the cams occurred during the testing. Future designs of the cam locking devices should prevent the bolts from moving in and out.

9. The main rails scuffed and dug into the container floor during the STS testing.

10. The bolts on the rear bumpers were loose at the end of the testing.

11. The lock rings on the roller shafts disengaged during testing and were found on the container floor.

12. The hex head rivets had loosened in several positions along the JMIP main rail.

13. The rail safety system pins that hold the min rail in position backed off during testing and had to be retightened.

E. CONCLUSIONS.

1. The purpose of the testing was to identify the adequacy of the JMIP for demonstration use and not final approval. Testing has identified deficiencies with the current design.

2. The JMIP, as currently designed, is adequate to be used to transport the mixed load of 155MM SLPs and JMICs when using the intermediate gates and cross straps on the end of the payload during the demonstrations.

3. The operational condition of the JMIP should be closely monitored during the demonstrations. Also, the Defense Ammunition Center, Transportation Engineering Division, shall be consulted for the ammunition loading and bracing instructions.

PART 2 - ATTENDEES

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PART 3 - TEST EQUIPMENT

1. Joint Modular Intermodal Platform Unit #4
   Manufactured by SEA BOX, Inc., East Riverton, NJ
   Model Number: J-MIP
   Serial Number: 00004
   Date of Manufacture: 26 January 2007
   Tare Weight: 4,240 lbs (without straps, rings and end gates)

2. Joint Modular Intermodal Container
   Designed by Naval PHST Center - Earle, NJ
   Length: 51-3/4 inches
   Width: 43-3/4 inches
   Height: 43 inches

3. Palletized Load System Truck
   Model #: M1074
   Manufactured by Oshkosh Truck Corporation, Oshkosh, WI
   ID #: 10T2P1NH6N1044011
   NSN: 2320-01-304-2277
   Serial #: 44011
   Curb Weight: 55,000 lbs

4. Truck, Tractor, MTV, M1088 A1
   ID #: J0231
   NSN: 2320 01 447 3893
   VSN: NL1FR5
   MFG Serial #: T-018447EFJM
   Weight: 19,340 lbs

5. Semitrailer, flatbed, breakbulk/container transporter, 22.5 ton
   Model #: M871
   Manufactured by Southwest Truck Body, St. Louis, MO
   ID #: NX03PJ – 0063
   NSN: 2330 00 122 6799
   Weight: 15,630 lbs

6. Railcar DODX 42353
   Manufactured by Thrall Car
   Length: 89 feet – 4 inches
   Empty Weight: 85,000 lbs.

7. Intermodal Container
   ID # USAU 020112-1
   Date of Manufacture: 05/95
   Manufactured by Med Union Containers, Izmir, Turkey
   Tare Weight: 4,920 lbs
   Maximum Gross Weight: 52,910 lbs

PART 4 - TEST PROCEDURES

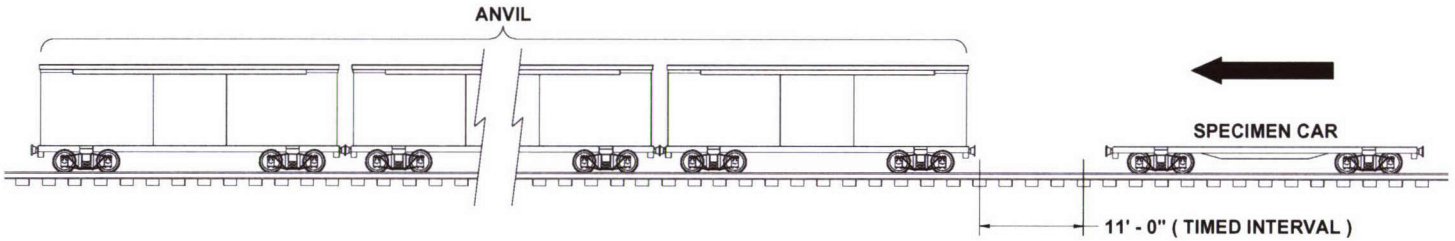
The test procedures outlined in this section were extracted from TP-94-01, "Transportability Testing Procedures," Revision 2, June 2004, for validating tactical vehicles and outloading procedures used for shipping munitions by tactical truck, railcar, and ocean-going vessel.

The rail impact will be conducted with the test load secured directly to the railcar. Inert (non-explosive) items were used to build the load. The test loads were prepared using the blocking and bracing procedures proposed for use with munitions (***see Part 6 – Drawings for procedures***). The weight and physical characteristics (weights, physical dimensions, center of gravity, etc.) of the test loads were similar to live (explosive) ammunition.

A. RAIL TEST. RAIL IMPACT TEST METHOD. The test load or vehicle will be secured to a flatcar. The equipment needed to perform the test will include the specimen (hammer) car, four empty railroad cars connected together to serve as the anvil, and a railroad locomotive. The anvil cars will be positioned on a level section of track with air and hand brakes set and with draft gears compressed. The locomotive unit will push the specimen car toward the anvil at a predetermined speed, then disconnect from the specimen car approximately 50 yards away from the anvil cars allowing the specimen car to roll freely along the track until it strikes the anvil. This will constitute an impact. Impacting will be accomplished at speeds of 4, 6, and 8.1 mph in one direction and at a speed of 8.1 mph in the reverse direction. The tolerance for the speeds is plus 0.5 mph, minus 0.5 mph for the 4 mph and 6 mph impacts, and plus 0.5 mph, minus 0 mph for the 8.1 mph impacts. The impact speeds will be determined by using an electronic counter to measure the time for the specimen car to traverse an 11-foot distance immediately prior to contact with the anvil cars (see Figure 1).

ASSOCIATION OF AMERICAN RAILROADS (AAR)

STANDARD TEST PLAN



4 BUFFER CARS (ANVIL)
WITH DRAFT GEAR
COMPRESSED AND AIR BRAKES IN A SET POSITION

ANVIL CAR TOTAL WT. 250,000 LBS (APPROX)

SPECIMEN CAR IS RELEASED BY SWITCH ENGINE TO
ATTAIN: IMPACT NO. 1 @ 4 MPH
IMPACT NO. 2 @ 6 MPH
IMPACT NO. 3 @ 8.1 MPH

THEN THE CAR IS REVERSED AND RELEASED BY SWITCH ENGINE TO ATTAIN:

IMPACT NO. 4 @ 8.1 MPH

Figure 1. Rail Impact Sketch

B. ON/OFF ROAD TEST.

1. **HAZARD COURSE**. The test load or vehicle will be transported over the 200-foot-long segment of concrete-paved road consisting of two series of railroad ties projecting 6 inches above the level of the road surface. The hazard course will be traversed two times (see Figure 2).

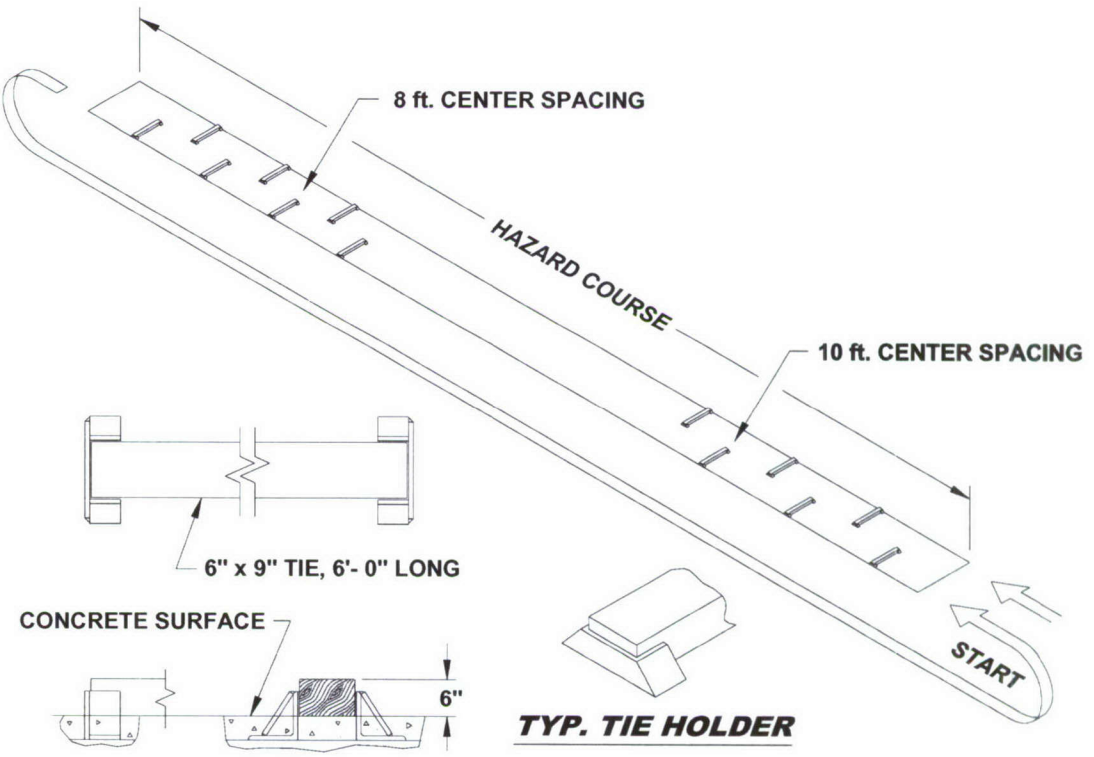


Figure 2. Hazard Course Sketch

a. The first series of 6 ties are spaced on 10-foot centers and alternately positioned on opposite sides of the road centerline for a distance of 50 feet.

b. Following the first series of ties, a paved roadway of 75 feet separates the first and second series of railroad ties.

c. The second series of 7 ties are spaced on 8-foot centers and alternately positioned on opposite sides of the road centerline for a distance of 48 feet.

d. The test load is driven across the hazard course at speeds that will produce the most violent vertical and side-to-side rolling reaction obtainable in traversing the hazard course (approximately 5 mph).

2. ROAD TRIP. The test load or vehicle will be transported for a distance of 30 miles over a combination of roads surfaced with gravel, concrete, and asphalt. The test route will include curves, corners, railroad crossings and stops and starts. The test load or vehicle will travel at the maximum speed for the particular road being traversed, except as limited by legal restrictions.

3. PANIC STOPS. During the road trip, the test load or vehicle will be subjected to three (3) full airbrake stops while traveling in the forward direction and one in the reverse direction while traveling down a 7 percent grade. The first three stops are at 5, 10, and 15 mph while the stop in the reverse direction is approximately 5 mph. This testing will not be required if the Rail Impact Test is performed.

4. WASHBOARD COURSE. The test load or vehicle will be driven over the washboard course at a speed that produces the most violent response in the vertical direction.

C. OCEAN-GOING VESSEL TEST. Shipboard Transportation Simulator (Test Method 5). The Shipboard Transportation Simulator (STS) is used for testing loads in 8-foot-wide by 20-foot-long intermodal freight containers. The specimen shall be positioned onto the STS and securely locked in place using the cam lock at each corner. Using the procedure detailed in the operating instructions, the STS shall begin oscillating at an angle of 30 degrees, plus or minus 2 degrees, either side of vertical center and a frequency of 2 cycles-per-

minute (30 seconds, plus or minus 2 seconds) for a duration of two (2) hours. This frequency shall be observed for apparent defects that could cause a safety hazard. The frequency of oscillation shall then be increased to 4 cycles-per-minute (15 seconds, plus or minus one second per cycle) and the apparatus operated for two (2) hours. If an inspection of the load does not indicate an impending failure, the frequency of oscillation shall be further increased to 5 cycles-per-minute (12 seconds, plus or minus one second per cycle), and the apparatus operated for four (4) hours. The operation does not necessarily have to be continuous; however, no changes or adjustments to the load or load restraints shall be permitted at any time during the test. After once being set in place, the test load (specimen) shall not be removed from the apparatus until the test has been completed or is terminated.

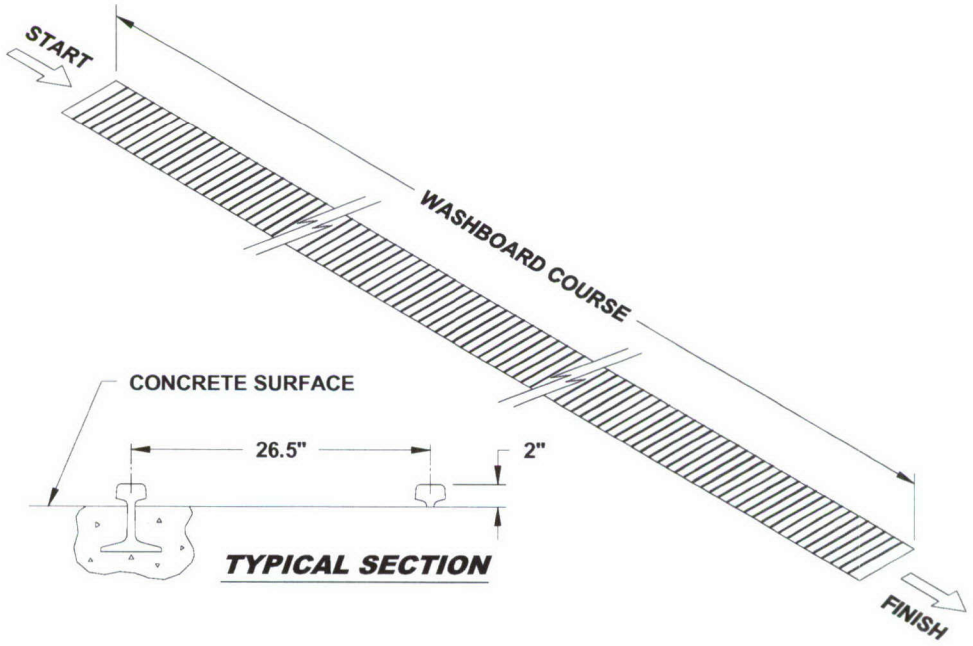


Figure 3. Washboard Course Sketch

PART 5 - TEST RESULTS

5.

Test Specimen: SEABOX Joint Modular Intermodal Platform Unit #4

Payload: Mixed Load of 155MM Separate Loading Projectiles (SLPs) and Joint Modular Intermodal Containers (JMIC).

Testing Date: 23-30 May 2007

Gross Weight: 26,180 lbs (JMIP and payload)

Note:

1. Prior to the start of testing the pins that hold the A-frame in the container transport were replaced, the loose hex head rivets on the top of the deck were tightened, and the bolts holding the rear bumpers were tightened.
2. Forward and aft restraint web straps were used at each end of the 155MM SLP payload. Traditionally, restraint straps across the end of the load are not used on 155MM SLP payloads to reduce the stress imposed during testing on the intermediate gates.
3. The SEA BOX intermediate gates were used to restrain the payload.
4. The connection between the JMIC interface rings and the intermediate gates had enough tolerance to allow the gates and dunnage to go past vertical during testing.
5. The engage/disengage mechanism on the intermediate gate is only accessible from one side. Therefore, the gates have to be properly oriented or the mechanism may be blocked by the payload. The gate design should be uniform, with access to the mechanism on each side so that they do not have a front or back.
6. The operation of the engage/disengage mechanism was unsafe when installing/removing the intermediate gates due to problems with finger pinching.
7. The intermediate gates need a location where nails can be driven in and cinched to prevent movement of the dunnage between the gate and the payload.

A. RAIL TEST.

Photo 1. Rail Impact Testing of the JMIP (Prior to Testing)

Description	Weight
Flatcar Number: DODX 42353	85,000 lbs.
JMIP	26,180 lbs.
M1 Flatrack with MLRS Pods	28,265 lbs.
Total Specimen Wt.	139,445 lbs.
Buffer Car (four cars)	257,900 lbs.

Figure 4.

Remarks: Figure 4 lists the test components and weights of the items used during the Rail Impact Tests.

Impact Number	Avg. Velocity (mph)
1	5.2
2	6.9
3	8.0
4	9.1
5	8.9

Figure 5.

Remarks:

1. Figure 5 lists the average speeds of the specimen car immediately prior to impact with the anvil. Impact #5 is the reverse impact.
2. Impacts #3 was determined to be a "no test" due to the insufficient velocity at impact. The test was repeated.
3. The JMIP was secured directly to the railcar for testing.
4. Inspection did not reveal any damage to the JMIP.

B. ON/OFF ROAD TESTS.

1. HAZARD COURSE.

Photo 2. Hazard Course Testing of the JMIP

Pass No.	Elapsed Time	Avg. Velocity (mph)
1	24 Seconds	6
2	23 Seconds	6

Figure 6.

Remarks:

1. Figure 6 lists the average speeds of the test load through the Hazard Course.
2. The JMIP was secured to the M871 trailer.
3. Inspection did not reveal any damage to the JMIP.

2. ROAD TRIP:

Remarks:

1. The Road Trip was conducted between the Hazard Course Passes #2 and #3.
2. Prior to the start of the Road Trip the safety system pins that hold the main rails in position had all backed off. They were all retightened and testing was continued.
3. The hex head rivet along the main rail at the fork lift pocket was loose.
4. Inspection following the Road Trip revealed no damage or movement of the JMIP.

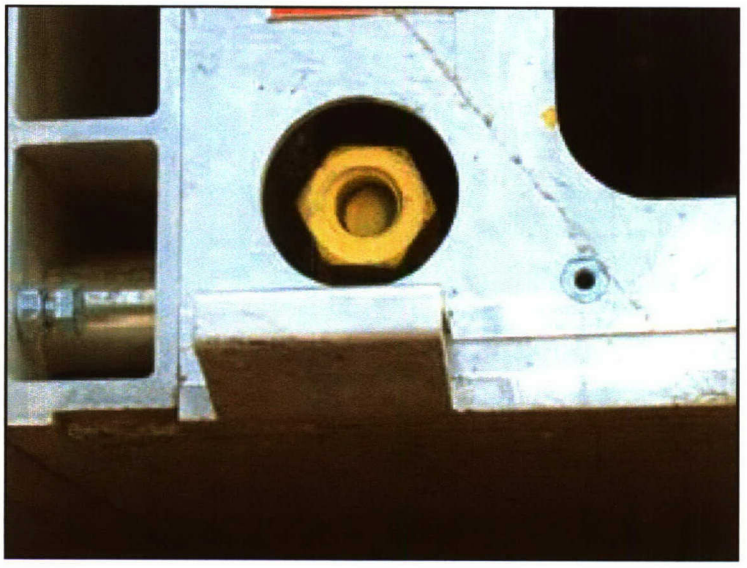


Photo 3. Main Rail System Safety Pins

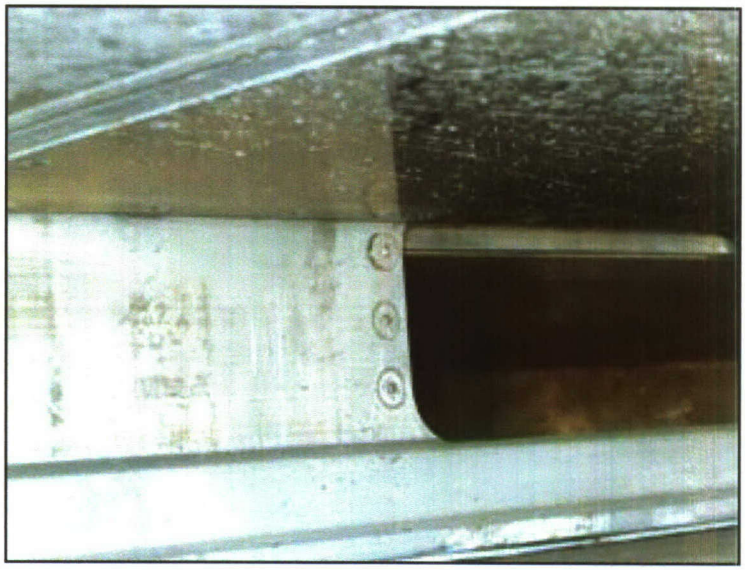


Photo 4. Loose Hex Head Rivet

3. **PANIC STOPS:** Testing was not required since the load was rail impact tested.

4. **HAZARD COURSE:**

Pass No.	Elapsed Time	Avg. Velocity (mph)
3	26 Seconds	6
4	23 Seconds	6

Figure 7.

Remarks:

1. Figure 7 lists the average speeds of the test load through the Hazard Course.
2. Inspection did not reveal any damage to the JMIP.

5. **WASHBOARD COURSE:**

Photo 5. Washboard Course Testing of the JMIP

Remarks: Inspection following the Washboard Course revealed no damage to the JMIP.

C. **RAIL TEST.**

Photo 6. Rail Impact Testing of the JMIP (Prior to Testing)

Description	Weight
Flatcar Number: DODX 42353	85,000 lbs.
JMIP in the Intermodal Container	31,100 lbs.
M1 Flatrack with MLRS Pods	28,265 lbs.
Total Specimen Wt.	144,365 lbs.
Buffer Car (four cars)	257,900 lbs.

Figure 8.

Remarks: Figure 8 lists the test components and weights of the items used during the Rail Impact Tests.

Impact Number	Avg. Velocity (mph)
1	3.6
2	7.0
3	8.9
4	8.1

Figure 9.

Remarks:

1. Figure 9 lists the average speeds of the specimen car immediately prior to impact with the anvil. Impact #4 is the reverse impact.
2. Following Impact #4, the JMIP moved 0.25 inches in the direction of the impact and the rubber end blocks compressed.
3. Inspection did not reveal any damage to the JMIP.
4. The JMIP was secured in the intermodal container.

D. ON/OFF ROAD TESTS.

1. HAZARD COURSE.

Photo 7. Hazard Course Testing of the JMIP

Pass No.	Elapsed Time	Avg. Velocity (mph)
1	26 Seconds	6
2	24 Seconds	6

Figure 10.

Remarks:

1. Figure 10 lists the average speeds of the test load through the Hazard Course.
2. The JMIP was secured in the intermodal container.
3. Inspection did not reveal any damage to the JMIP.

2. ROAD TRIP:

Remarks:

1. The Road Trip was conducted between the Hazard Course Passes #2 and #3.
2. Inspection following the Road Trip revealed no damage or movement of the JMIP.

3. **PANIC STOPS:** Testing was not required since the load was rail impact tested.

4. **HAZARD COURSE:**

Pass No.	Elapsed Time	Avg. Velocity (mph)
3	25 Seconds	6
4	24 Seconds	6

Figure 11.

Remarks:

1. Figure 11 lists the average speeds of the test load through the Hazard Course.
2. Inspection did not reveal any damage to the JMIP.

5. **WASHBOARD COURSE:**

Photo 8. Washboard Course Testing of the JMIP

Remarks:

1. Inspection following the Washboard Course revealed no damage to the JMIP.
2. The cam on the driver's side backed off during testing.

E. SHIPBOARD TRANSPORTATION SIMULATION (STS).

Remarks:

1. The JMIP slid side to side throughout the STS testing. The movement of the adjustment bolt on the cams occurred during the testing. Future designs of the cam locking devices should prevent the bolts from moving in and out.
2. The main rails scuffed and dug into the container floor during the STS testing.

F. OBSERVATIONS:

1. The bolts on the rear bumpers were loose at the end of the testing.
2. The lock rings on the roller shafts disengaged during testing and were found on the container floor.
3. The hex head rivets had loosened in several positions along the JMIP main rail.

G. CONCLUSIONS:

1. The purpose of the testing was to identify the adequacy of the JMIP for demonstration use and not final approval. Testing has identified deficiencies with the current design.
2. The JMIP, as currently designed, is adequate to be used to transport the mixed load of 155MM SLPs and JMICs when using the intermediate gates and restraint straps on the end of the payload during the demonstrations.
3. The operational condition of the JMIP should be closely monitored during the demonstrations. Also, the Defense Ammunition Center, Transportation Engineering Division, shall be consulted for the ammunition loading and bracing instructions.

PART 6 – DRAWINGS

The following drawing represents the load configuration that was subjected to the test criteria.

TEST SKETCH

LOADING AND BRACING OF MIXED LOAD OF 155MM PROJECTILES AND JOINT MODULAR INTERMODAL CONTAINTERS (JMICS) ON THE JOINT MODULAR INTERMODAL PLATFORM (JMIP)

THIS SIX PAGE DOCUMENT DEPICTS D864 155MM PROJECTILES AND JMICS ON A SEABOX JMIP FOR EVALUATION TRANSPORTABILITY TESTING

NOTE: FORWARD AND AFT RETAINING WEB STRAPS WERE ADDED TO ATTEMPT TO PREVENT PERMANENT DAMAGE TO THE INTERMEDIATE GATES SECURING THE D864 155MM PROJECTILES.

PREPARED DURING MAY 2007 BY:
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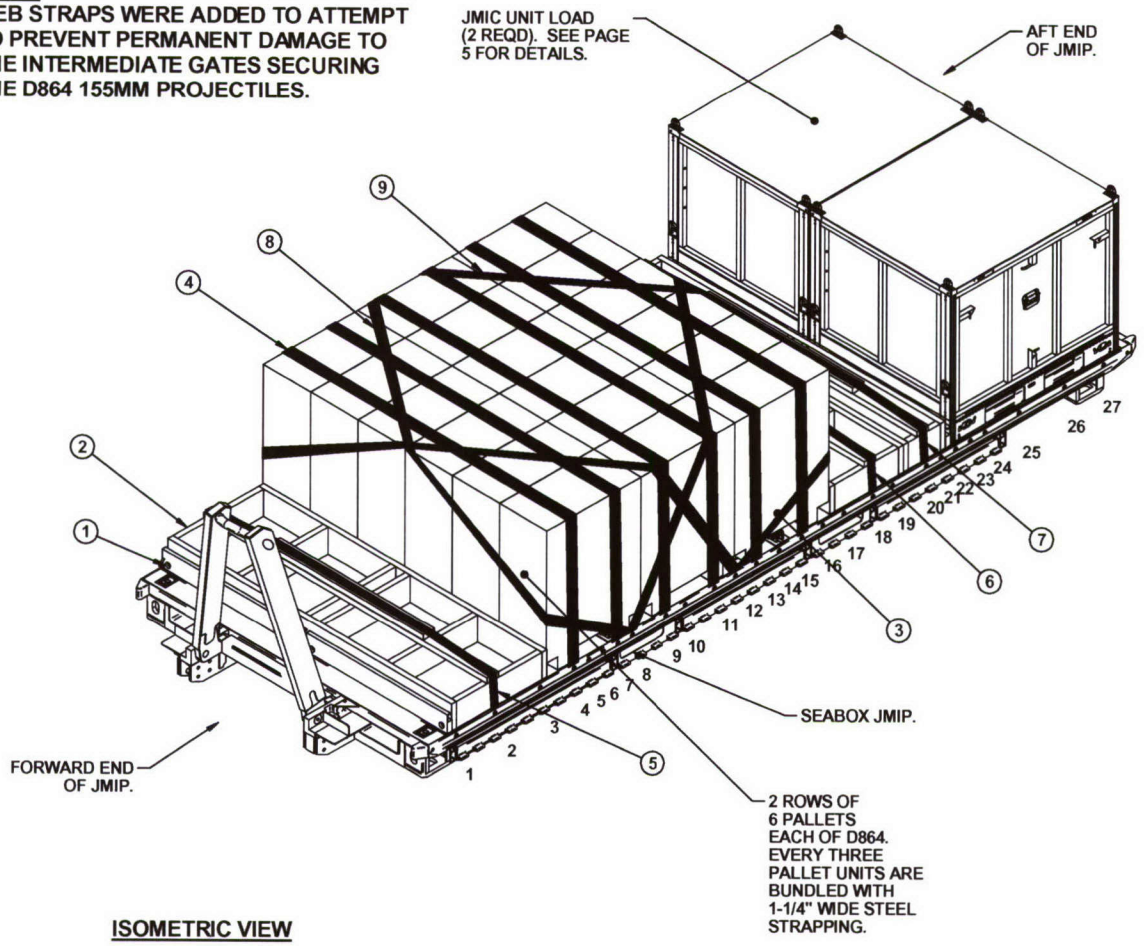
NOTE: FORWARD AND AFT RETAINING WEB STRAPS WERE ADDED TO ATTEMPT TO PREVENT PERMANENT DAMAGE TO THE INTERMEDIATE GATES SECURING THE D864 155MM PROJECTILES.



ISOMETRIC VIEW

(KEY NUMBERS CONTINUED)

⑧ FORWARD RESTRAINT STRAP, 3-INCH WIDE WEB STRAP TIEDOWN ASSEMBLY FOR CROP (2 REQD). INSTALL ONE WEB STRAP ASSEMBLY TO EXTEND FROM THE EIGHTTH TIEDOWN PROVISION ON ONE SIDE OF CROP, AROUND THE FRONT FACE OF THE D846 PALLET UNITS, OVER THE TOP OF THE D846 PALLET UNITS, AND BACK DOWN TO THE TWELFTH TIEDOWN PROVISION ON THE OPPOSITE SIDE OF THE CROP. ALIGN SCUFF SLEEVES OVER ALL SHARP EDGES AND FIRMLY TENSION STRAP.

⑨ AFT RESTRAINT STRAP, 3-INCH WIDE WEB STRAP TIEDOWN ASSEMBLY FOR CROP (2 REQD). INSTALL ONE WEB STRAP ASSEMBLY TO EXTEND FROM THE TWELFTH TIEDOWN PROVISION ON ONE SIDE OF CROP, AROUND THE REAR FACE OF THE D846 PALLET UNITS, OVER THE TOP OF THE D846 PALLET UNITS, AND BACK DOWN TO THE EIGHTH TIEDOWN PROVISION ON THE OPPOSITE SIDE OF THE CROP. ALIGN SCUFF SLEEVES OVER ALL SHARP EDGES AND FIRMLY TENSION STRAP.

KEY NUMBERS

① INTERMEDIATE GATE (4 REQD). ALIGN HOLES IN ENDS OF THE GATES WITH JMIC TIEDOWN PROVISIONS ON THE JMIP AT THE LOCATIONS SHOWN. SEE DETAIL ON PAGE 3.

② FORWARD BLOCKING ASSEMBLY (1 REQD). SEE DETAIL ON PAGE 3. CENTER AGAINST FORWARD INTERMEDIATE GATE.

③ AFT BLOCKING ASSEBMLY (1 REQD). SEE DETAIL ON PAGE 4. CENTER AGAINST AFT INTERMEDIATE GATE.

④ HOLD-DOWN STRAP, 3-INCH WIDE WEB STRAP (6 REQD). INSTALL EACH STRAP TO EXTEND FROM THE DESIGNATED TIEDOWN PROVISION ON ONE SIDE OF JMIP, OVER THE TOP OF THE PALLET UNITS, TO THE CORRESPONDING TIEDOWN PROVISION ON THE OPPOSITE SIDE OF THE JMIP. ALIGN SCUFF SLEEVES OVER ALL SHARP EDGES AND FIRMLY TENSION STRAP.

⑤ FORWARD RETAINER STRAP, 2-INCH WIDE WEB STRAP ASSEMBLY (1 REQD). INSTALL TO EXTEND FROM THE SECOND TIEDOWN PROVISION ON ONE SIDE OF THE JMIP, OVER THE TOP OF THE FORWARD BLOCKING ASSEMBLY STRAPPING BOARD, TO THE SECOND TIEDOWN PROVISION ON THE OPPOSITE SIDE OF THE JMIP. ALIGN SCUFF SLEEVES OVER ALL SHARP EDGES AND FIRMLY TENSION STRAP.

⑥ FIRST AFT RETAINER STRAP, 2-INCH WIDE WEB STRAP ASSEMBLY (1 REQD). INSTALL TO EXTEND FROM THE EIGHTEENTH TIEDOWN PROVISION ON ONE SIDE OF THE JMIP, OVER THE TOP OF THE AFT BLOCKING ASSEMBLY STRAPPING BOARD, TO THE EIGHTEENTH TIEDOWN PROVISION ON THE OPPOSITE SIDE OF THE JMIP. ALIGN SCUFF SLEEVES OVER ALL SHARP EDGES AND FIRMLY TENSION STRAP.

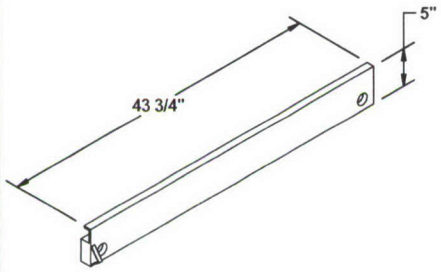
⑦ SECOND AFT RETAINER STRAP, 2-INCH WIDE WEB STRAP ASSEMBLY (1 REQD). INSTALL TO EXTEND FROM THE TWENTY-SIXTH TIEDOWN PROVISION ON ONE SIDE OF THE JMIP, OVER THE TOP OF THE AFT BLOCKING ASSEMBLY STRAPPING BOARD, TO THE TWENTY-SIXTH TIEDOWN PROVISION ON THE OPPOSITE SIDE OF THE JMIP. ALIGN SCUFF SLEEVES OVER ALL SHARP EDGES AND FIRMLY TENSION STRAP.

(CONTINUED AT LEFT)

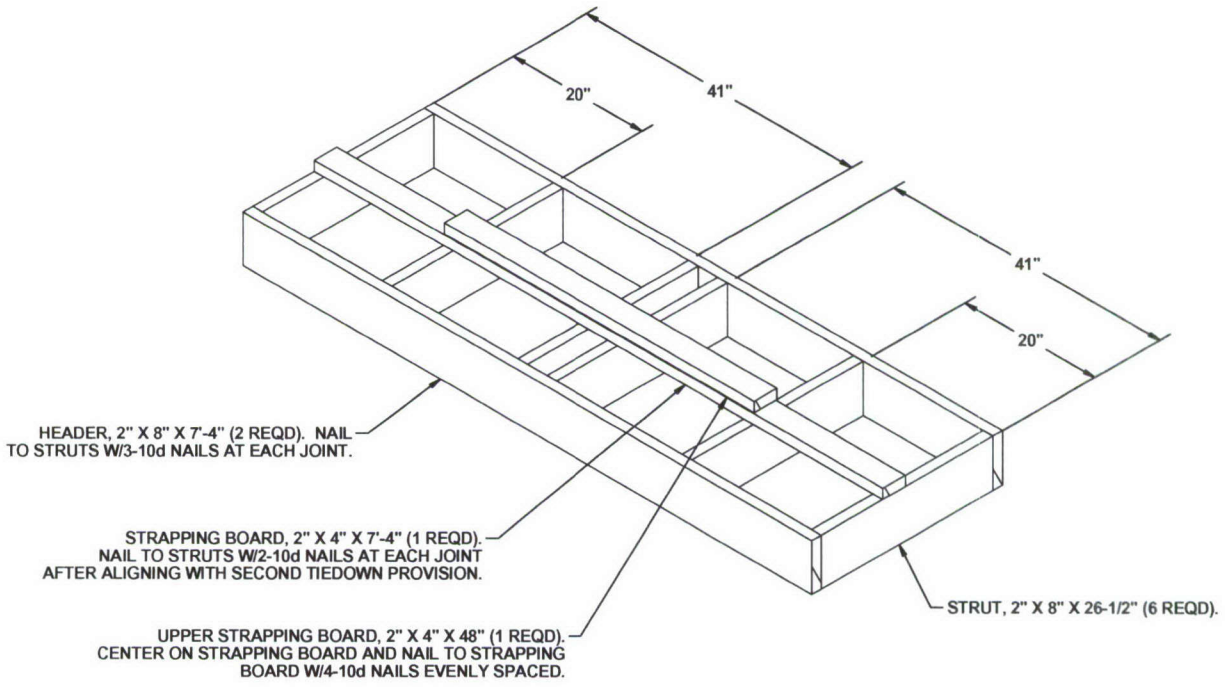
BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 4" 2" X 8"	34 71	23 95
NAILS	NO. REQD	POUNDS
10d (3")	136	2.06
2" WEB STRAP TIEDOWN ASSEMBLY - 3 REQD - - - - - -		18 LBS
INTERMEDIATE GATES - - - - - - 4 REQD - - - - - -		33 LBS

LOAD AS SHOWN ON PAGE 2

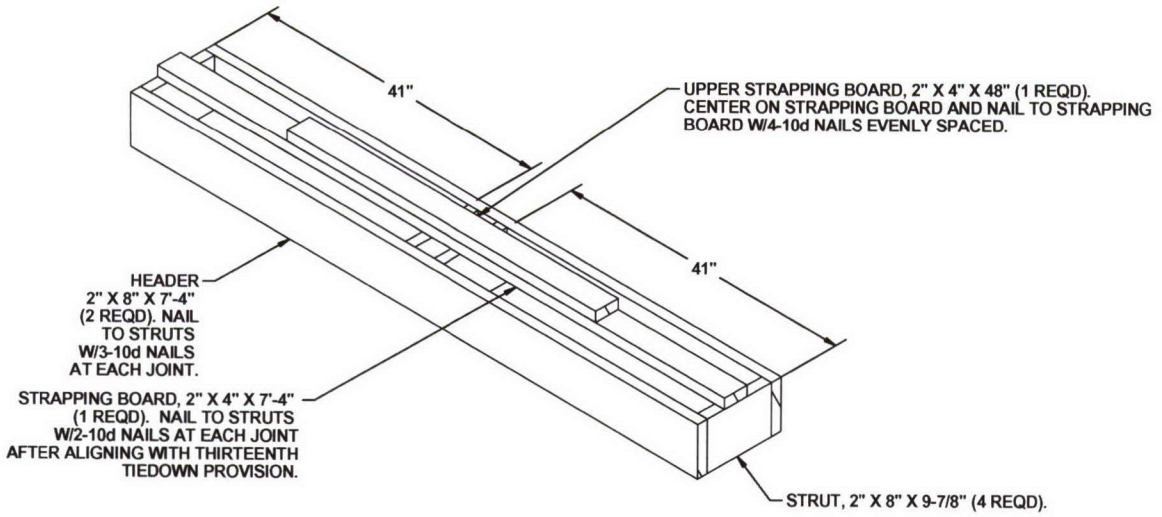
ITEM	QUANTITY	WEIGHT (APPROX)
D864 PALLET UNIT	18	15,732 LBS
JMIC UNIT LOAD	2	5,942 LBS
DUNNAGE		289 LBS
JMIP		4,240 LBS
TOTAL WEIGHT - - - - - -		26,203 LBS (APPROX)



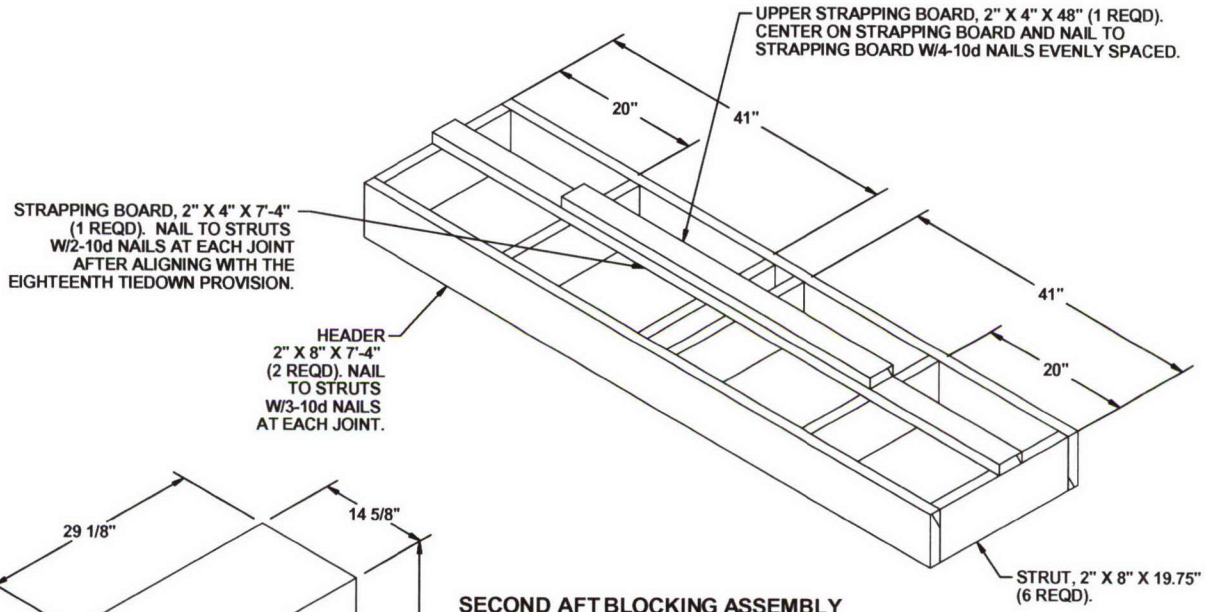
INTERMEDIATE GATE
(4 REQD)



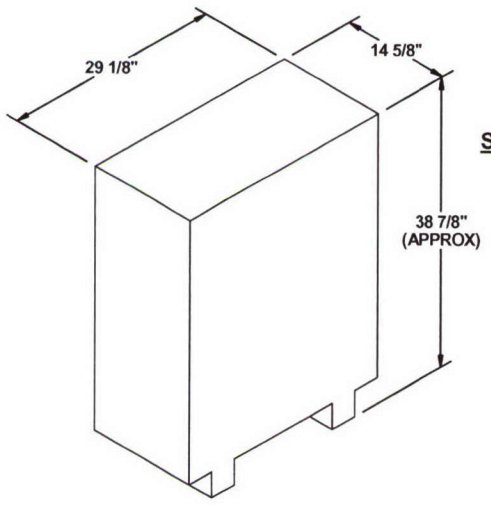
FORWARD BLOCKING ASSEMBLY
(1 REQD)



FIRST AFT BLOCKING ASSEMBLY
(1 REQD)

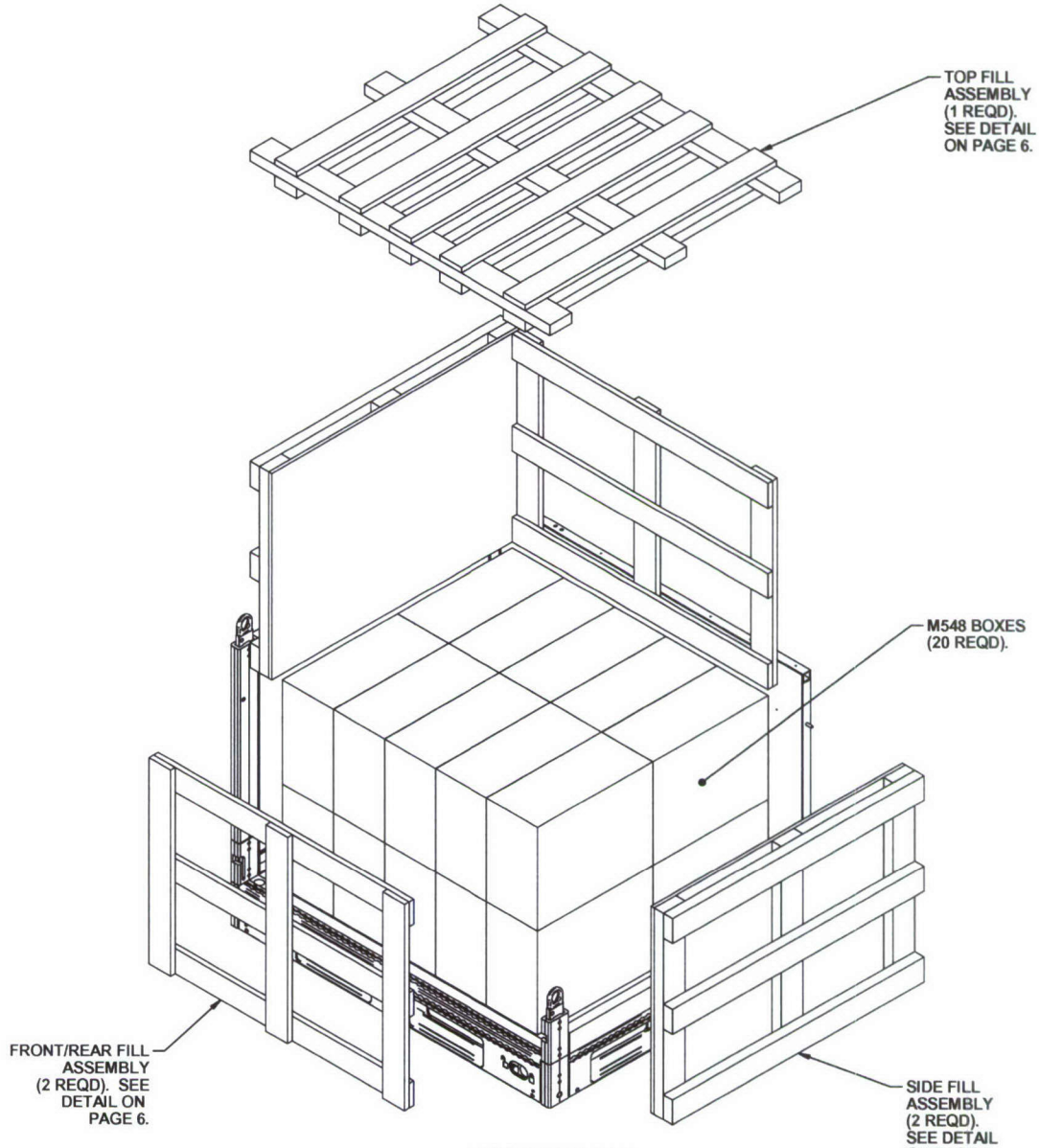


SECOND AFT BLOCKING ASSEMBLY
(1 REQD)



D864 PALLETS UNIT DETAIL
155MM SLP, 8/LARGE PALLET
(12 REQD)

874 LBS (APPROX)

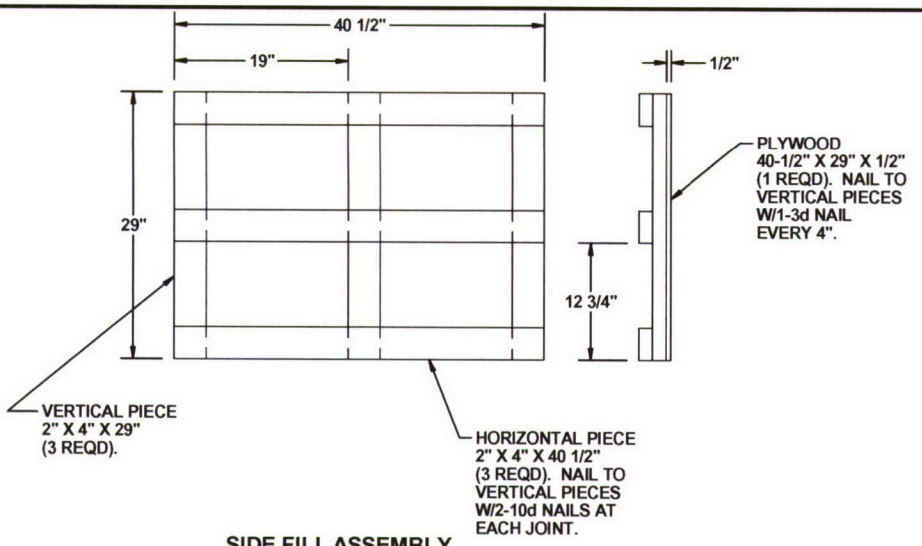


JMIC UNIT LOAD
(2 REQD)

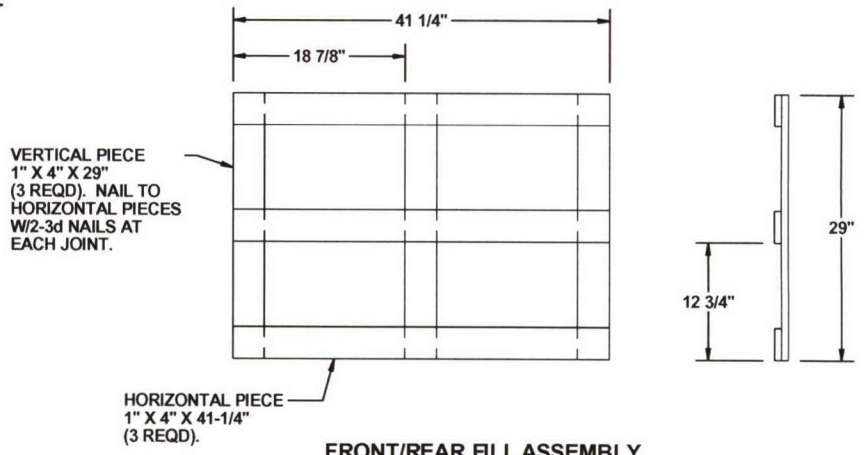
20 M548 BOXES @ 125 LBS	2,500 LBS
DUNNAGE	146 LBS
CLOSED PANEL NAVY JMIC	325 LBS
TOTAL WEIGHT	2,971 LBS (APPROX)
CUBE	56.4 CU FT (APPROX)

BILL OF MATERIAL

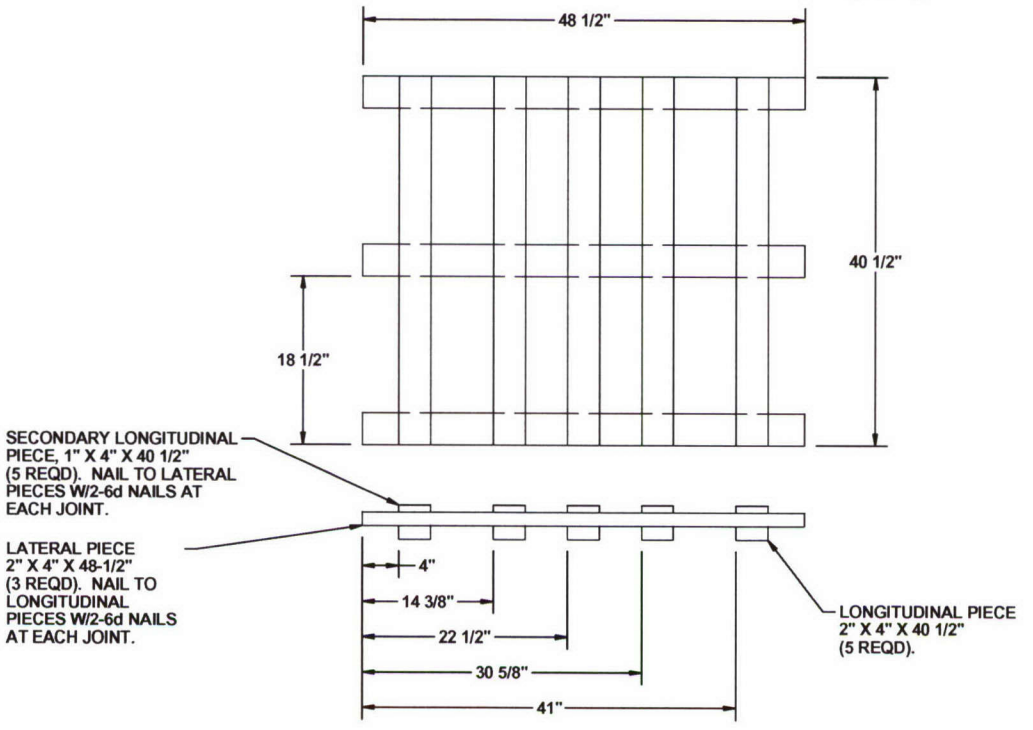
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	52	18
2" X 4"	64	43
NAILS	**NO. REQD**	**POUNDS**
3d (1-1/4")	84	.16
6d (2")	60	.35
10d (3")	36	.54
NAVY PANEL JMIC	1 REQD	325 LBS
1/2 PLYWOOD	17 SQ FT	23 LBS



SIDE FILL ASSEMBLY
(2 REQD)



FRONT/REAR FILL ASSEMBLY
(2 REQD)



TOP FILL ASSEMBLY
(1 REQD)